

IBM BladeCenter Layer 2/3 GbE Switch
Module



Installation Guide

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Module



Installation Guide

Note:

Before using this information and the product it supports, read the *Warranty Information* document, the general information in Appendix B, "Notices," on page 39, and the *Important Notices* document that comes with the product. Read the *IBM System Safety Notices* and the *License Agreement for Machine Code (LAMC)* document on the *IBM Documentation CD*. Read the *Environmental Notices and User Guide* on the *IBM Environmental Notices CD*.

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Systems Safety Notices* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Systems Safety Notices* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1:



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



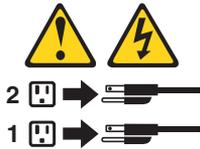
Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Statement 5:



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 13:



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. The IBM BladeCenter Layer 2/3 GbE Switch Module

This *Installation Guide* contains information about setting up, installing and configuring both the copper and fiber models of the IBM® BladeCenter® Layer 2/3 GbE Switch Module.

For installation details, see Chapter 2, “Installing and removing a switch module and its components,” on page 11. For additional information, see the instructions in your BladeCenter documentation. This is also referred to throughout this document as the GbE switch module, switch module, or I/O module. All BladeCenter unit types are referred to throughout this document as the BladeCenter unit.

The copper and fiber models of the GbE switch module are two of the types of I/O modules that can be installed in a BladeCenter unit. See the documentation for your BladeCenter unit type for specific I/O-module installation requirements.

You can obtain up-to-date information about the BladeCenter GbE switch module and other IBM server products at <http://www.ibm.com/systems/bladecenter/>.

Notes:

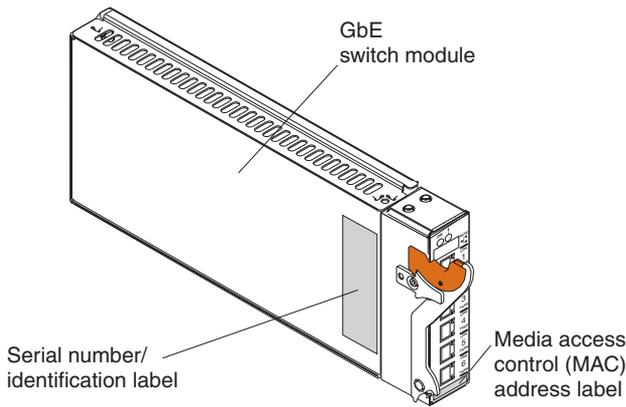
1. The illustrations in this document might differ slightly from your hardware.
2. This document applies to both the copper and fiber models of the switch module.

Product name	IBM BladeCenter Layer 2/3 GbE Switch Module
Serial number	_____
Media access control (MAC) address	_____

The product name and serial number are on the identification label on the side of the GbE switch module. You will need this information when you register the GbE switch module with IBM. The media access control (MAC) address is on a separate label on the information panel under the external Ethernet connectors.

The following illustration shows the locations of the identification label and the MAC address label on the switch module.

Note: The illustrations in this document might differ slightly from your hardware.



Related documentation

This *Installation Guide* contains setup and installation instructions for the GbE switch module. This document also provides general information about your GbE switch module including how to get help. The most recent versions of this *Installation Guide* and all other BladeCenter documentation are at <http://www-947.ibm.com/support/entry/portal/documentation/>, enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at <http://www.elink.ibmink.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

In addition to this *Installation Guide*, the following related documentation is available for your GbE switch module:

- *Systems Safety Notices* guide

This document contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Systems Safety Notices* document. This document is available on the IBM BladeCenter *Documentation* CD that comes with your product.

- *Application Guide for IBM BladeCenter Layer 2/3 GbE Switch Module*

This document contains detailed setup and installation instructions for the GbE switch module. It provides the following information:

- Configuration instructions for your GbE switch module
 - Information about features
 - Information about getting help
 - Guidance for planning, implementing, and administering LAN operating system software
 - Usage examples
 - Troubleshooting information for your GbE switch module
- *Browser-Based Interface Quick Guide for IBM BladeCenter Layer 2/3 GbE Switch Module*

This document contains information about the browser-based interface that you can use to perform the following tasks:

- Access switch information
- Calculate and obtain statistical data
- Perform switch configuration

- *Command Reference for IBM BladeCenter Layer 2/3 GbE Switch Module*

This document contains the following information:

- Information about getting started
- Information about first-time connection to the GbE switch module
- Telnet program interface requirements
- Browser-based network interface requirements
- Command line interface (CLI) operations
- Maintenance menus
- Statistics
- Supported SNMP MIBs
- Syslog messages
- Usage examples

Additional documents on the IBM BladeCenter *Documentation* CD include the License Agreement for Machine Code (LAMC).

In addition to the documentation in this library, be sure to review the following information:

- *BladeCenter Management Module Command-Line Interface Reference Guide*

This document explains how to use the management-module CLI to directly access BladeCenter management functions as an alternative to using the Web-based user interface. The CLI also provides access to the text-console command prompt on each blade server through a serial over LAN (SOL) connection. This information is available at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp>.

- *BladeCenter Management Module User's Guide*

This document provides general information about the management module for your BladeCenter type, including information about features, how to configure the management module, and how to get help. This information is available at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp>.

- *Menu-Based CLI Command Reference Guide* or *ISCLI-Industry Standard CLI Command Reference Guide* for your BladeCenter unit type

This document provides to help you prepare for system installation, software updates, and configuration. This document is available at <http://www-947.ibm.com/support/entry/portal/docdisplay?Indocid=MIGR-54667>.

You might have to install an I/O expansion card (also known as an Ethernet expansion card) on some blade servers when installing the GbE switch module into certain I/O-module bays of the BladeCenter unit. For information about the types of compatible I/O expansion cards for the blade servers, contact your

IBM authorized reseller. See the I/O expansion card documentation for details about I/O expansion card installation, configuration, and use.

Features

This section provides a summary of the features of your IBM BladeCenter Layer 2/3 GbE Switch Module. For detailed information about the features, see the *Application Guide* for your switch module.

- Ports
 - Internal ports
 - Fourteen internal full-duplex Gigabit ports, one connected to each of the blade servers in the BladeCenter unit.
 - Two internal full-duplex 10/100 Mbps ports connected to the management module.
 - External ports

Copper or fiber connection for making 10/100/1000 Mbps connections to a backbone, end stations, and servers.

 - Copper ports use six external 1000BASE-T RJ-45 connectors.
 - Fiber ports use six 1000BASE SX SFP transceivers that are included with the GbE switch module.
- Supported IEEE standards
 - 10/100/1000 auto-negotiation
 - Fixed mode option
 - External serial port uses one RS-232 console port that provides an additional means to install software and configure the switch module.
 - Static link aggregation (Ether channel compatible)
 - 802.3 ad link aggregation (three external trunk groups)
 - 802.1 P (priority queues, eight per port)
 - 802.1 P with IP DiffServ
 - 802.1 P with Q priority (SMAC/DMAC, SIP/DIP, VLAN priorities)
 - 802.1Q (VLAN, 128 active)
 - 802.1 spanning tree
 - 802.1s spanning tree/VLAN (16 spanning tree instances)
 - 802.1w rapid spanning tree
 - 802.1x port access control
 - Fast port forward
 - Fast uplink convergence
 - 802.3x flow control
 - IEEE 802.3 Nway auto-negotiation
 - GVRP (this feature to be included in a future release)
 - Fiber connections standard using a small-form-factor pluggable (SFP) transceiver that provides 1000BASE SX (850 nm wavelength) communication over multimode fiber cable (50 μ or 62.5 μ) at distances of up to 550 meters. (1000BASE LX is not supported.)

- Layer 2 bridge/switch functions
 - L2 port filters (static)
 - Port mirroring (any port to any port)
 - Jumbo frames (up to 9 Kb)
 - IGMP snooping (V1 and V2)
 - IGMP filtering
 - LAG distribution scheme (MAC SA/DA and IP SA/DA)
 - L2 multicast forwarding (hardware-based media speed)
 - L2 forwarding performance (media speed/non-blocking)
- Access control and security
 - Radius/TACACS+
 - SSH
 - Multiple user IDs and passwords
 - User access control
 - Change tracking and remote logging
 - Scriptable command-line interface (CLI)
 - SNMP (V1 and V3)
 - Dual firmware image retention
 - Text format configuration file
 - HTTP browser graphical user interface (GUI)
 - Telnet interface for CLI
 - Automatic remote system log
 - Firmware image update (TFTP and FTP)
 - Layer 3 filtering
 - Layer 3 routing
 - Layer 3 protocols (RIP v1, RIP v2, OSPF v2 with ECMP/NSSA, BGP 4 (receive updates))
 - DHCP/BOOTP
 - VRRP
 - Interchassis redundancy (L2 and L3)
- Special functions
 - Serial over LAN (SOL)
 - L2 trunk failover
 - SNMP MIB list
 - Bcast/Mcast storm control

- Management

You can manage the switch by using a Simple Network Management Protocol (SNMP) version 1 interface, as described in the *Application Guide*. The SNMP interface supports the following Internet standards:

- RFC 1155, Structure and identification of management information for TCP/IP-based internets, M. T. Rose, K. McCloghrie. May-01-1990.
- RFC 1157, Simple Network Management Protocol (SNMP). J.D. Case, M. Fedor, M. L. Schoffstall, C. Davin. May-01-1990.
- RFC 1212, Concise MIB definitions. M. T. Rose, K. McCloghrie. Mar-01-1991.
- RFC 1213, Management Information Base for Network Management of TCP/IP-based internets: MIB-II. K. McCloghrie, M. T. Rose. Mar-01-1991.
- RFC 1493, Definitions of Managed Objects for Bridges. E. Decker, P. Langille, A. Rijsinghani, K. McCloghrie. July 1993.
- RFC 1573, Evolution of the Interfaces Group of MIB-II. K. McCloghrie, F. Kastenholz. January 1994.
- RFC 1643, Definitions of Managed Objects for the Ethernet-like Interface Types. F. Kastenholz. July 1994.
- RFC 1657, Definitions of Managed Objects for the Fourth Version of the Border Gateway Protocol (BGP-4) using SMIV2. S. Willis, J. Burruss, J. Chu, Ed. July 1994.
- RFC 1724, RIP Version 2 MIB Extension. G. Malkin, F. Baker. November 1994.
- RFC 1757, Remote Network Monitoring Management Information Base. S. Waldbusser. February 1995.
- RFC 1850, OSPF Version 2 Management Information Base. F. Baker, R. Coltun. November 1995.
- RFC 2021, Remote Network Monitoring Management Information Base Version 2 using SMIV2. S. Waldbusser. January 1997 (partial support).
- RFC 2037, Entity MIB using SMIV2. K. McCloghrie, A. Bierman. October 1996 (partial support).

- Network cables

Note: To make sure that the BladeCenter unit installation complies with electromagnetic compatibility (EMC) product regulations for intra-building lightning surges, you must use shielded LAN cables that are grounded at both ends.

- 10BASE-T:
 - UTP Category 3, 4, 5 (100 meters maximum)
 - 100-ohm STP (100 meters maximum)
- 100BASE-TX:
 - UTP Category 5 (100 meters maximum)
 - EIA/TIA-568 100-ohm STP (100 meters maximum)
- 1000BASE-T:
 - UTP Category 6 (standard for 1 GB devices)
 - UTP Category 5e (100 meters maximum)
 - UTP Category 5 (100 meters maximum)
 - EIA/TIA-568B 100-ohm STP (100 meters maximum)
- 1000BASESX:
 - 850 Nm wavelength, multimode fiber, 50 μ or 62.5 μ (550 meters maximum), with LC duplex connector

- RS-232 serial cable:
 - 3 meter console cable DB-9 to USB connector (non-standard use of USB connector) that comes with the GbE switch module

Standards

The GbE switch module supports the following IEEE standards:

- IEEE 802.1d Spanning Tree Protocol
- IEEE 802.1P Tagged Packets
- IEEE 802.1Q Tagged VLAN (frame tagging on all ports when VLANs are enabled)
- IEEE 802.2 Logical Link Control
- IEEE 802.3 10BASE-T Ethernet
- IEEE 802.3u 100BASE-TX Fast Ethernet
- IEEE 802.3x Full-duplex Flow Control
- IEEE 802.3z
 - 1000BASE-SX Gigabit Ethernet
 - Link Negotiation

Notices and statements used in this document

The caution and danger statements that appear in this document are also in the multilingual *Systems Safety Notices* document, which is on the IBM BladeCenter *Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Systems Safety Notices* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

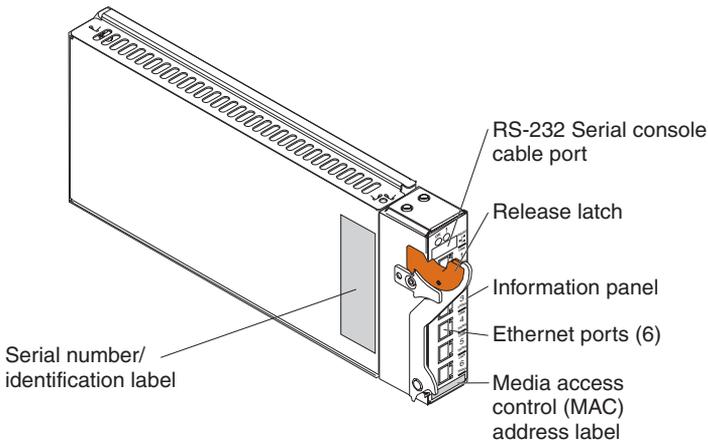
Major components of the GbE switch modules

Orange on the release latch on the GbE switch module identifies this device as a hot-swap component. You can install or remove this component while the BladeCenter unit is running.

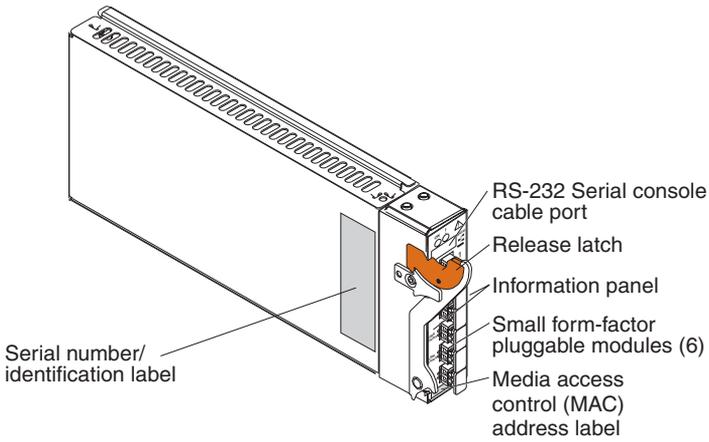
The following illustrations show the major components of the copper and fiber GbE switch modules.

Note: The illustrations in this document might differ slightly from your hardware.

The following illustration shows the major components of the copper GbE switch module.



The following illustration shows the major components of the fiber GbE switch module.



For more information about the components of the information panel, see Chapter 5, “Information panel LEDs and external ports,” on page 27. For more information about the MAC address, see the *Application Guide* for your switch module.

Chapter 2. Installing and removing a switch module and its components

See the *Installation and User's Guide* for your BladeCenter unit type for information about the I/O-module bay locations in the BladeCenter unit and specific requirements for installing I/O modules in your BladeCenter unit.

Attention: To maintain proper system cooling, each I/O-module bay must contain either an I/O module or a filler module; each blade bay must contain either a blade server or a filler blade.

Your BladeCenter unit supports a minimum of one hot-plug GbE switch module, in I/O-module bay 1. The GbE switch modules in I/O-module bays 1 and 2 are for the integrated Ethernet controllers in the applicable blade server. You might have to install GbE switch modules in other I/O-module bays of the BladeCenter unit when additional Ethernet controllers are installed or activated on a blade server.

For details about network interface requirements and expansion options, see the following documents:

- *Planning and Installation Guide* for your BladeCenter unit type
- *Installation and User's Guide* for your BladeCenter unit type
- *Installation and User's Guide* for each blade server type

Installation guidelines

Before you begin to install the GbE switch module in your BladeCenter unit, read the following information:

- Read the safety information beginning on page v and the guidelines in "Handling static-sensitive devices" on page 12, and read the safety statements in the BladeCenter unit publications.
- Orange on the release latch on the GbE switch module identifies this device as a hot-swap component. You can install or remove this component while the BladeCenter unit is running. See the instructions in this chapter for more information about installing or removing hot-swap or hot-plug components.
- You do not have to turn off the BladeCenter unit to install or replace any of the hot-swap modules in the BladeCenter unit.
- If you plan to install additional GbE switch modules in the I/O-module bays of your BladeCenter unit, you might also have to install an I/O expansion card in the applicable blade server to support the GbE switch modules in these bays.

System reliability considerations

To help ensure proper cooling and system reliability, make sure that:

- Each of the I/O-module bays in the BladeCenter unit has either an I/O module or filler module installed.
- A removed hot-swap module is replaced with another module or filler module within 1 minute of removal.
- A removed hot-swap blade server is replaced with another blade server or filler blade within 1 minute of removal.
- Cables for the GbE switch module are routed according to the illustrations and instructions in this document.

Handling static-sensitive devices

Attention: Static electricity can damage the system and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

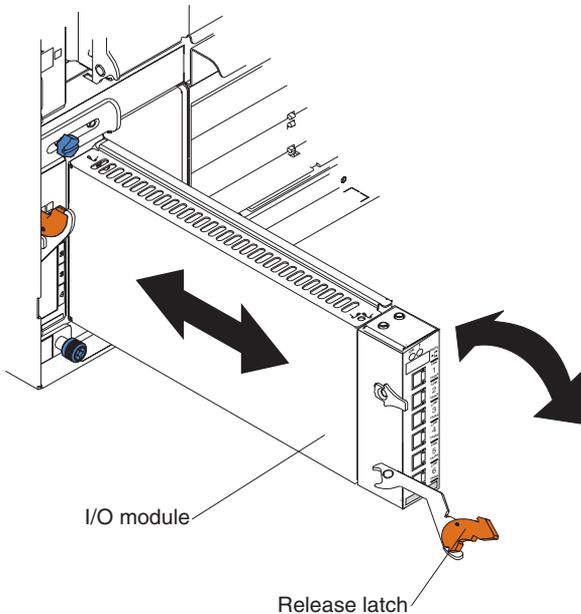
To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the BladeCenter unit without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the BladeCenter chassis or on a metal surface.
- Take additional care when handling devices during cold weather. Heating reduces indoor humidity and increases static electricity.

Installing a switch module

The following illustration shows how to install an I/O module in a typical BladeCenter unit.

Note: These procedures apply to both the copper and fiber GbE switch modules.



Note: The illustrations in this document might differ slightly from your hardware.

Complete the following steps to install an I/O module.

Attention: Make sure that the I/O-module cover is installed and closed before you install the I/O module in the BladeCenter unit.

1. Read the safety information beginning on page v and “Installation guidelines” on page 11.
2. If an acoustic attenuation module is installed on your BladeCenter unit, remove it. See the documentation for your BladeCenter unit for instructions.
3. Select an I/O-module bay in which to install the GbE switch module.

Note: For details about I/O-module bay requirements, see the documentation for your BladeCenter unit type and blade servers.

4. Remove the filler module from the selected I/O module bay. Store the filler module for future use.
5. If you have not already done so, touch the static-protective package that contains the switch module to any *unpainted* metal surface of the BladeCenter unit or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds.
6. Remove the switch module from its static-protective package.
7. Make sure that the release latch on the switch module is in the open position (perpendicular to the module).
8. Slide the switch module into the I/O-module bay until it stops.
9. Push the release latch on the front of the switch module to the closed position. After you insert and lock the switch module, it is turned on, and a power-on self-test (POST) occurs to verify that the switch module is operating correctly.
10. The POST results are displayed by the status LEDs. Make sure that the LEDs on the switch module indicate that it is operating correctly. Make sure that the OK LED on each switch module is lit. See Chapter 5, “Information panel LEDs and external ports,” on page 27 for a more detailed description of the operation of these LEDs.
For additional information, see Chapter 6, “Solving problems,” on page 33.
11. If you have other switch modules to install, do so now; otherwise, go to step 12.

Note: To make sure that the BladeCenter unit installation complies with EMC product regulations for intra-building lightning surges, you must use shielded LAN cables that are grounded at both ends.

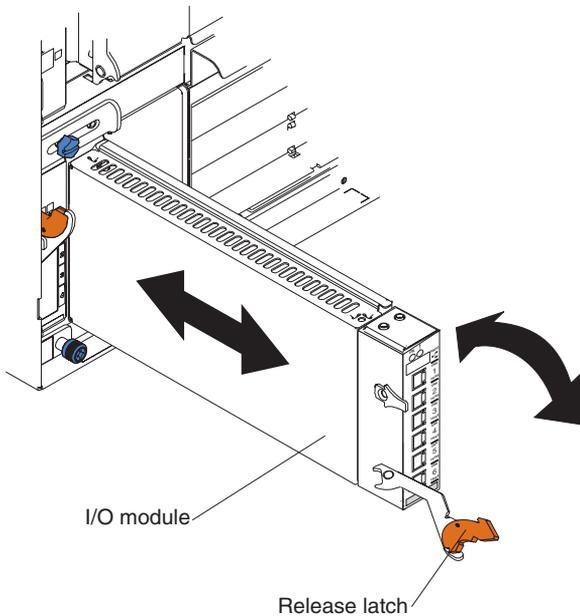
12. Attach any cables or cords that are required by the switch module. For the location of the connectors on the BladeCenter unit, see the *Installation and User's Guide* for your BladeCenter unit type. For cable requirements, see page 7.
13. Replace the acoustic attenuation module, if you removed it in step 2 on page 13.

Removing a switch module

Attention: To maintain proper cooling and system reliability, each I/O-module bay in the BladeCenter unit must have either an I/O module or filler module installed. If you remove a hot-swap module, you must replace it with another module or filler module within 1 minute of removal.

Complete the following steps to remove a switch module:

1. Read the safety information beginning on page v and “Installation guidelines” on page 11.
2. If an acoustic attenuation module is installed on your BladeCenter unit, remove it. See the documentation for your BladeCenter unit for instructions.
3. Disconnect any cables from the switch module that you are removing.
4. Pull the release latch toward the bottom of the switch module as shown in the following illustration. The module moves out of the I/O-module bay approximately 0.64 cm (0.25 inch).



5. Slide the switch module out of the I/O-module bay and set it aside.
6. Place either another switch module or a filler module in the I/O-module bay within 1 minute.
7. If you placed another switch module in the I/O-module bay, reconnect any cables that you disconnected in step 3.

8. Replace the acoustic attenuation module, if you removed it in step 2.

Installing and removing a small-form-factor pluggable (SFP) module

The fiber model of the GbE switch module contains small form-factor pluggable (SFP) modules with wire tabs. SFP modules are laser products that are used to convert electrical signals to optical signals. Use the information in the following sections to replace a defective SFP module.

Handling an SFP module

Before installing an SFP module, read the following information:

- The SFP module housing has an integral guide key that is designed to prevent you from inserting the SFP module incorrectly.
- Use minimal pressure when you insert the SFP module into an SFP module port. Forcing the SFP module into an SFP module port can cause damage to the SFP module or the SFP module port.
- You can insert or remove the SFP module while the BladeCenter unit is running.
- You must first insert the SFP module into the SFP module port before you can connect the fiber-optic cable.
- You must remove the fiber-optic cable from the SFP module before you remove the SFP module from the GbE switch module. See “Removing an SFP module” on page 18 for more information.

Installing an SFP module

Complete the following steps to install an SFP module into the fiber GbE switch module.

Note: When you are installing SFP modules with the power on, the release latch must be partially opened to for you gain access to the SFPs in connectors 1, 2, and 3.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

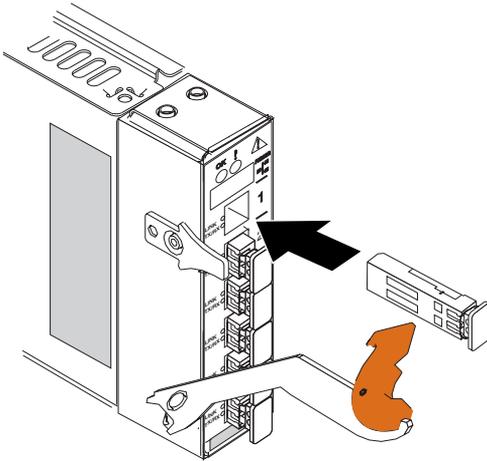
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Attention: When you handle static-sensitive devices, take precautions to avoid damage from static electricity. For details about handling static-sensitive devices, see “Handling static-sensitive devices” on page 12.

1. Read the information in “Handling an SFP module” on page 16.
2. Remove the SFP module from its static-protective package.

3. Insert the SFP module into the SFP module port until it clicks into place.



4. Remove the protective cap from the SFP module and store it in a safe place.
5. Connect the fiber-optic cable (see “Connecting a fiber-optic cable to an SFP module” on page 21 and any cables you disconnected earlier).

Removing an SFP module

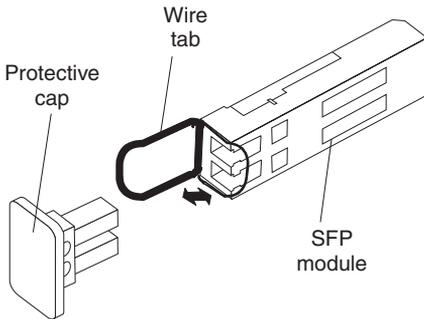
Complete the following steps to remove a defective SFP module from the fiber GbE switch module.

Note: When you are removing SFP modules with the power on, the release latch must be partially opened for you to gain access to the SFPs in connectors 1, 2, and 3.

1. Read the information in “Handling an SFP module” on page 16.
2. Remove the fiber-optic cable or protective cap from the SFP module that you want to replace. For more information about removing the cable, see “Removing the fiber-optic cable” on page 23.

Attention: To avoid damage to the cable or the SFP module, make sure that you disconnect the fiber-optic cable *before* you remove the SFP module.

3. Unlock the SFP module by pulling the wire tab straight out as shown in the following illustration.



4. Grasp the wire tab on the SFP module and pull it out of the SFP module port.
5. Rotate the wire tab on the SFP module to the closed position by rotating it downward.
6. Replace the protective cap on the SFP module.
7. Place the SFP module into a static-protective package.

Chapter 3. Cabling the GbE switch module

This chapter describes how to cable the GbE switch module and its components.

Connecting a fiber-optic cable to an SFP module

After the SFP module is installed in the SFP module port on the fiber GbE switch module, connect a fiber-optic cable to the SFP module.

Handling fiber-optic cables

Attention: To avoid damage to the fiber-optic cables, follow these guidelines:

- Do not route the cable along a folding cable-management arm.
- When attaching the cable to a device on slide rails, leave enough slack in the cable so that it does not bend to a radius of less than 38 mm (1.5 in.) when the device is extended or become pinched when the device is retracted.
- Route the cable away from places where it can be snagged by other devices in the rack.
- Do not overtighten the cable straps or bend the cables to a radius of less than 38 mm (1.5 in.).
- Do not put excess weight on the cable at the connection point. Make sure that the cable is well supported.

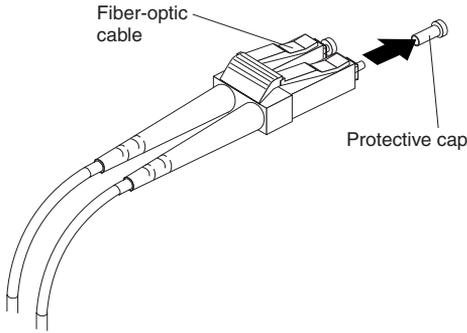
Installing the fiber-optic cable

Complete the following steps to connect a fiber-optic cable to the SFP module:

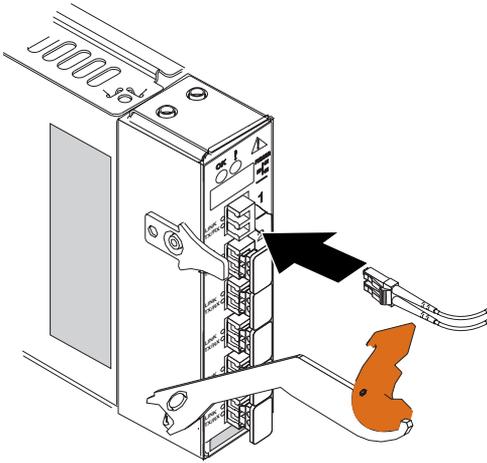
Note: The illustrations in this document might differ slightly from your hardware.

1. Read the information in “Handling fiber-optic cables” on page 21.

2. Remove the protective caps from the end of the fiber-optic cable (see the following illustration).



3. Connect the fiber-optic cable to the installed SFP module, as shown in the following illustration.



4. Check the LEDs on the switch module. When the switch module is operating correctly, the green link LED is lit. For information about the status of the switch module LEDs, see "LEDs" on page 29.

Removing the fiber-optic cable

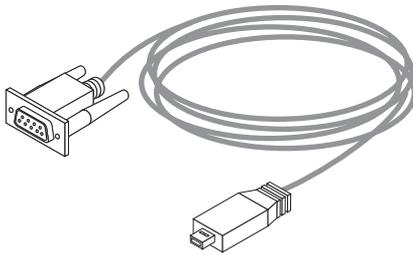
Complete the following steps to remove a fiber-optic cable from an SFP module:

1. Read the information in “Handling fiber-optic cables” on page 21.
2. Gently pull the fiber-optic cable from the SFP module that is installed in the SFP module port on the switch module.
3. Replace the protective caps on the end of the fiber-optic cable.

Connecting the serial console cable

Complete the following steps to connect the serial console cable to the switch module and console device:

1. Remove the serial console cable from its packaging (see the following illustration).



2. Connect the USB-style connector end of the serial console cable to the RS-232 console port on the GbE switch module and the other end of the cable to the console device (server, mobile computer, and so on).

Chapter 4. Updating the software and configuring the switch module

Make sure that you are using the latest version of management module firmware for your BladeCenter unit type. See the *IBM BladeCenter Management Module User's Guide* for your unit type, located at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp> for your BladeCenter unit type for additional information.

For instructions on configuring the switch module, see the *IBM BladeCenter Advanced Management Module User's Guide* information located at <http://publib.boulder.ibm.com/infocenter/bladectr/documentation/index.jsp>.

Make sure that you are using the latest version of the switch module software. For instructions on upgrading the switch module software, see the *Menu-Based CLI Command Reference* or the *ISCLI—Industry Standard CLI Command Reference Guide* at <http://www-947.ibm.com/support/entry/portal/docdisplay?lnocid=MIGR-54667>.

For instructions on configuring the switch module, see the *IBM BladeCenter Command Reference Guide* for your switch module located at <http://www.bladenetwork.net/IBM-BladeCenter-support.html>.

Chapter 5. Information panel LEDs and external ports

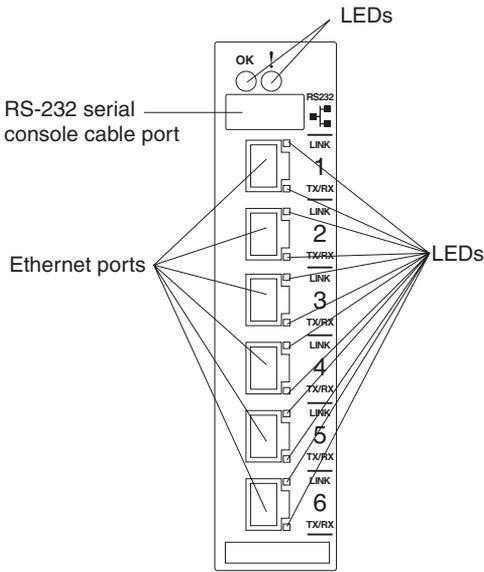
This chapter describes the information panel and LEDs on the copper and fiber GbE switch modules. This chapter also identifies the external ports on the information panel.

Information panel

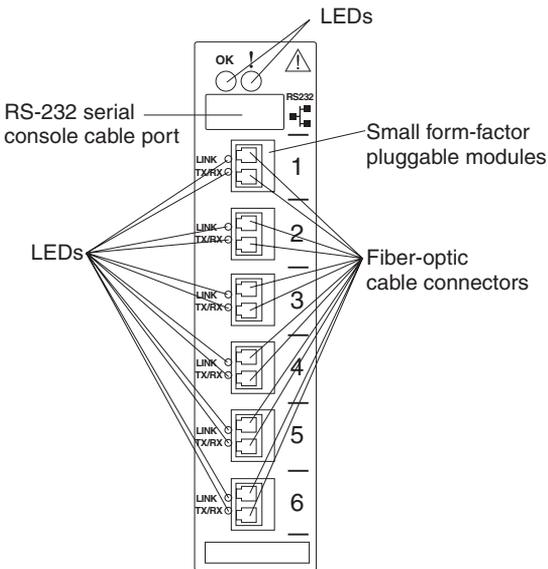
As shown in the following illustrations, the information panel of the GbE switch modules contains the following LEDs and ports:

- The LEDs that display the status of the GbE switch module and the network (see “LEDs” on page 29).
- One RS-232 console port that provides an additional means to install software and configure the switch module. This USB-style connector enables connection of a special serial cable that is supplied with the GbE switch module.
- The copper model of the GbE switch module has six external 1000BASE-T Ethernet ports for 10/100/1000 Mbps connections to external Ethernet devices, such as backbones, end stations, and servers. These ports are identified as EXT1, EXT2, EXT3, EXT4, EXT5, and EXT6 in the switch configuration menus and are labeled 1 through 6 (from top to bottom) on the GbE switch module.
- The fiber model of the GbE switch module has six external 1000BASE SX SFP transceiver ports for 10/100/1000 Mbps connections to external Ethernet devices, such as backbones, end stations, and servers. These ports are identified as EXT1, EXT2, EXT3, EXT4, EXT5, and EXT6 in the switch configuration menus and are labeled 1 through 6 (from top to bottom) on the GbE switch module.

The following illustration shows the information panel for the copper GbE switch module.



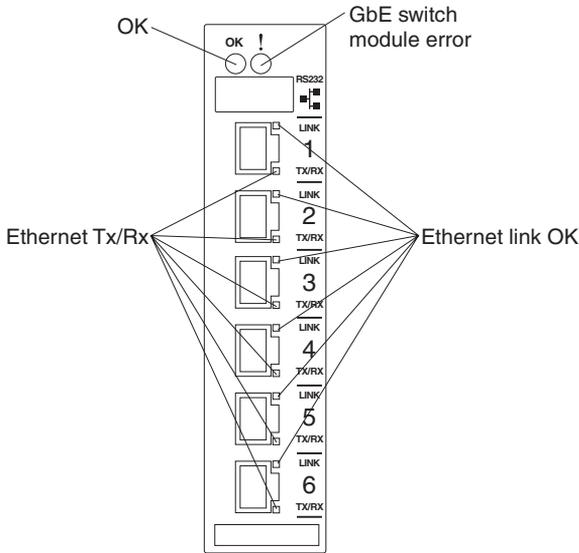
The following illustration shows the information panel for the fiber GbE switch module.



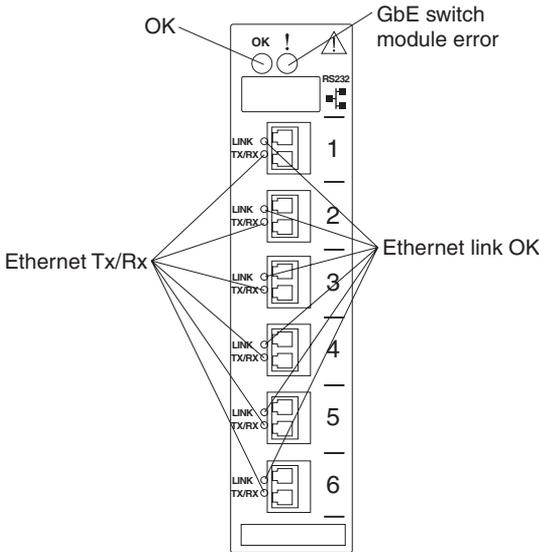
LEDs

The LEDs on the information panel of the GbE switch module are OK and GbE switch module error (fault). In addition, each external port on the GbE switch module contains an Ethernet link OK LED and an Ethernet Tx/Rx LED. The following illustrations show the LEDs on the GbE switch modules. A description of each LED follows the illustrations.

The following illustration shows the LEDs on the copper GbE switch module.



The following illustration shows the LEDs on the fiber GbE switch module.



Note: An amber LED is lit when a system error or event has occurred. To identify the error or event, check the LEDs on the information panel of the GbE switch module. For additional information, see Chapter 6, “Solving problems,” on page 33.

OK: This green LED is on the left side of the information panel, above the four external 10/100/1000 Mbps ports. When this LED is lit, it indicates that the GbE switch module has passed the power-on self-test (POST) with no critical faults and is operational.

GbE switch module error (fault): This amber LED is on the right side of the information panel, above the four external 10/100/1000 Mbps ports. When this LED is lit, it indicates that the GbE switch module has failed the POST or detected an operational fault.

Note: When the GbE switch module error LED is lit, the system-error LED on the BladeCenter unit will also be lit.

Ethernet link OK: This green link status LED is at the top of each external 10/100/1000 Mbps port. When this LED is lit on a port, it indicates that there is a connection (or link) to a device using that connector.

Ethernet Tx/Rx: This green activity LED is at the bottom of each external 10/100/1000 Mbps port. When this LED flashes on a port, it indicates that data is being transmitted or received (that is, activity is occurring) between that port and another device on the network link. The flash frequency is proportional to the amount of traffic on the network link.

Chapter 6. Solving problems

This section provides basic troubleshooting information to help you solve some problems that might occur while you are setting up the GbE switch module. The *Application Guide* for your switch module contains more details about troubleshooting the GbE switch module.

If you cannot locate and correct the problem using the information in this section, see Appendix A, “Getting help and technical assistance,” on page 37.

Running POST

To ensure that it is fully operational, the GbE switch module processes a series of tests during power-up or a restart (power-on self-test, or POST). These tests take approximately 1 minute to complete. The management module reads the test results and displays them for you. During normal operation, these tests are completed without error, and the green OK LED is lit. However, if POST fails, the amber GbE switch module error (fault) LED and the system-error LED on the BladeCenter unit will be lit. An event is stored in the event log in the System Status panel of the management module. The specific failure is displayed on the System Status I/O Module pane of the management-module interface. The following illustrations are examples of the windows that will be displayed if a POST error occurs.

Note: For the location and description of the GbE switch module LEDs, see Chapter 5, “Information panel LEDs and external ports,” on page 27.

POST errors

There are two types of errors: noncritical and critical. A noncritical error applies to one port, and the GbE switch module is operational. You can continue to operate the GbE switch module; however, you must replace it as soon as possible. When critical errors occur, the GbE switch module does not operate. If a critical error occurs, complete the following steps:

1. Open the Management Module Switch Information window.
2. Turn off the GbE switch module; then, turn it back on.
3. After POST is completed, the management-module interface displays the results. Refresh the window to view the POST results. If the error remains, the GbE switch module is defective. Replace the GbE switch module.

The following table describes the basic critical and noncritical failures. This abbreviated list is representative; it is not intended as an exhaustive list. An error code is associated with each failure. Error codes appear on the

Management Module Switch Information window. Be sure to note the applicable error code and corresponding failure. You might have to provide this information when you call IBM. For more details, see Appendix A, “Getting help and technical assistance,” on page 37.

Diagnostic indicator (in hex)	Failing functional area	Failure criticality
00 - 7F	Base internal functions	Critical
80 - 9F	Internal interface failures	Noncritical
A0 - AF	External interface errors	Noncritical
B0 - FE	Reserved	Noncritical
FF	Switch module “good” indicator	Operation

Chapter 7. Parts listing

The following table shows the list of the parts that come with the switch module option. This parts listing supports the copper and fiber models of the IBM BladeCenter Layer 2/3 GbE Switch Module.

Part	FRU number	CRU/FRU
Copper GbE switch module assembly	32R1869	CRU
Fiber GbE switch module assembly	32R1870	CRU
Small form-factor pluggable module	26R0808	CRU
Serial console cable	02R9365	CRU

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your BladeCenter product or optional device, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* at <http://www.ibm.com/supportportal/>.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with BladeCenter systems also describes the diagnostic tests that you can perform. Most BladeCenter systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the software.

Using the documentation

Information about your IBM BladeCenter system and preinstalled software, if any, or optional device is available at <http://www-947.ibm.com/support/entry/portal/documentation/>. That documentation can include printed documents, online documents, readme files, and help files. For instructions for using the diagnostic programs.

Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination and Service Guide* on the IBM Documentation CD that comes with your BladeCenter unit. IBM maintains pages on the World Wide Web where

you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/supportportal/>.

To access the latest documentation, go to <http://www-947.ibm.com/support/entry/portal/documentation/>, enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at <http://www.elink.ibm.link.ibm.com/public/applications/publications/cgibin/pbi.cgi>.

Getting help and information from the World Wide Web

Up-to-date information about IBM systems, optional devices, services, and support is available on the World Wide Web at <http://www.ibm.com/supportportal/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with BladeCenter products. For information about which products are supported by Support Line in your country or region, see <http://www-03.ibm.com/services/supline/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See <http://www.ibm.com/planetwide/> for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Notices

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Important notes

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for approximately 1000 bytes, MB stands for approximately 1 000 000 bytes, and GB stands for approximately 1 000 000 000 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from IBM.

Maximum memory may require replacement of the standard memory with an optional memory module.

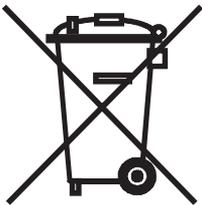
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Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.



Notice: This mark applies only to countries within the European Union (EU) and Norway.

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various

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注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

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Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

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In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

In the Netherlands, the following applies.



For Taiwan: Please recycle batteries.



Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

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Taiwanese Class A warning statement

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Chinese Class A warning statement

中华人民共和国“A类”警告声明

声明
此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

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